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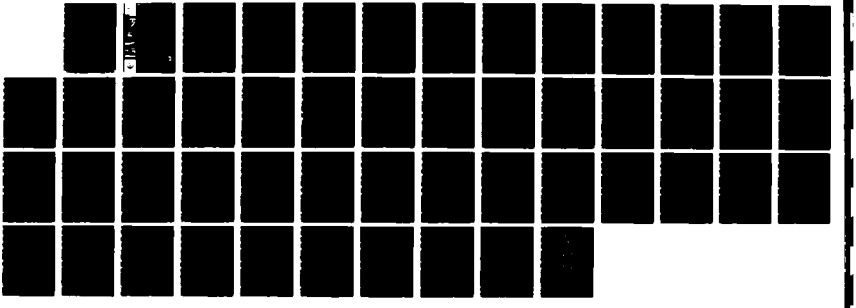

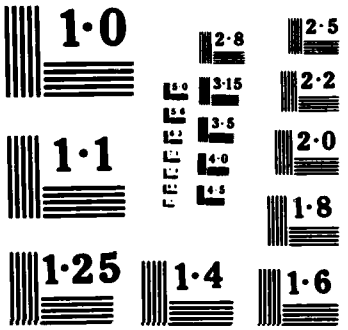
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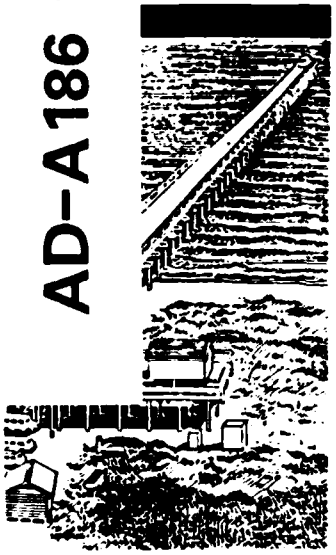

MISCELLANEOUS PAPER CERC-87-16

NEARSHORE WAVE TRANSFORMATION STUDY OF SITES NEAR PORT CANAVERAL INLET, FLORIDA

by

Willie Ann Brown, Rebecca M. Brooks, Edward F. Thompson

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631, Vicksburg, Mississippi 39180-0631

September 1987
Final Report

Prepared for US Army Engineer District, Jacksonville
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19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This report describes a 20-year summary of nearshore wave estimates of shoaling and transformation of waves in the vicinity of Cape Canaveral. The objective of this study was to obtain data which could be used in determining sediment transport in the Port Canaveral Inlet. These data consisted of breaking wave conditions at five different sites along the coastline near Port Canaveral Inlet.

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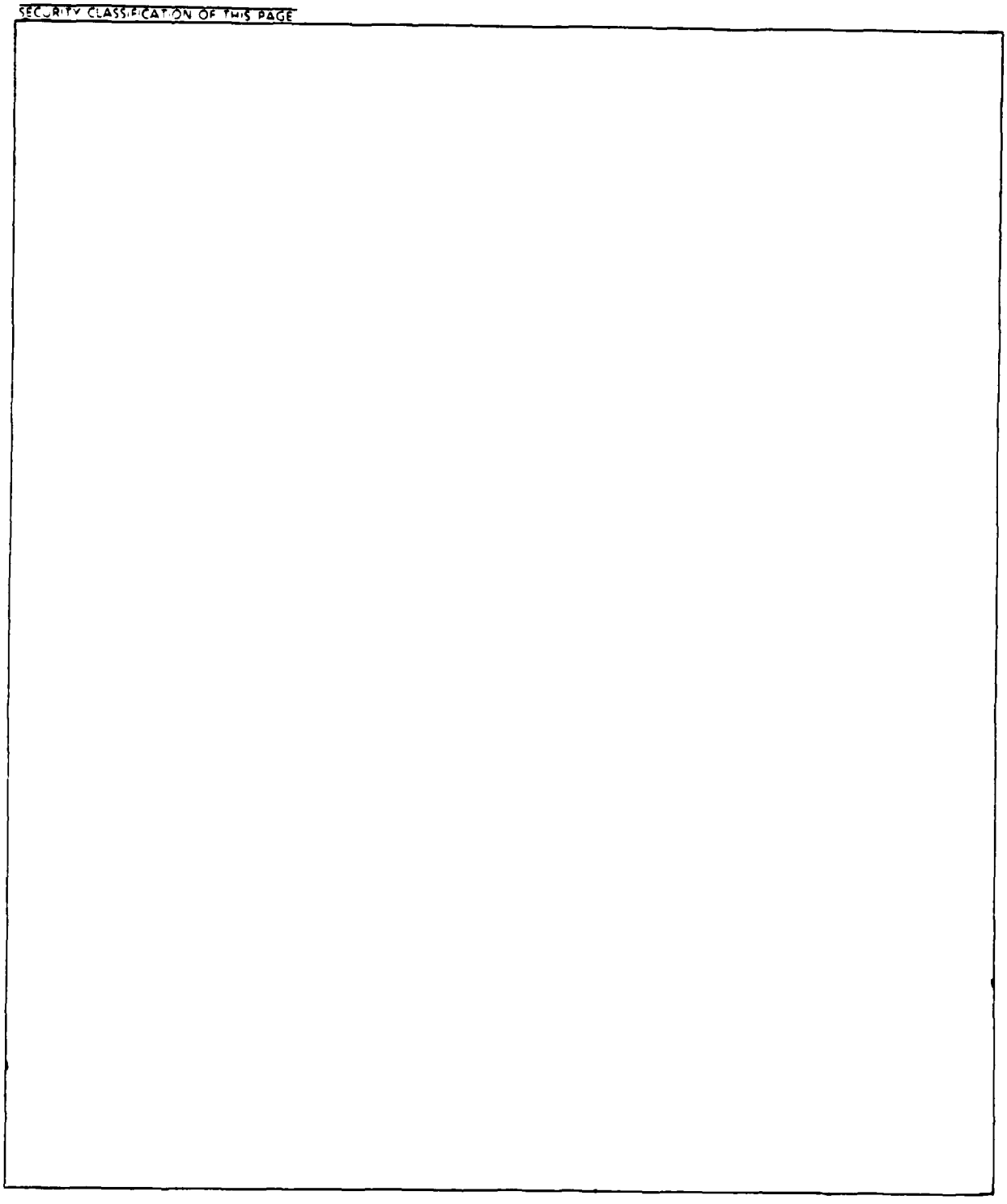

PREFACE

This report describes a study of the shoaling and transformation of waves in the vicinity of Cape Canaveral and Port Canaveral Inlet, Fla. The study was funded by the US Army Engineer District, Jacksonville (SAJ), Jacksonville, Fla. Mr. Earl Howard and Ms. Mary Ann Gerber, SAJ, were Technical Monitors during the conduct of this study.

The report was prepared by Mses. Willie Ann Brown and Rebecca M. Brooks, Coastal Oceanography Branch (CR-O), and Dr. Edward F. Thompson, Chief, CR-O, Research Division (CR), Coastal Engineering Research Center (CERC), under direct supervision of Mr. H. Lee Butler, Chief, CR; and under general supervision of Mr. Charles C. Calhoun, Jr., Assistant Chief, and Dr. James R. Houston, Chief, CERC, US Army Engineer Waterways Experiment Station (WES). The assistance of Mses. Mary A. Cialone, Panola Rivers, and Odia R. Winston, and Messrs. William D. Corson and Bruce A. Ebersole and Dr. Robert E. Jensen is acknowledged.

Commander and Director of WES during this study was COL Dwayne G. Lee, CE. Technical Director was Dr. Robert W. Whalin.

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NEARSHORE WAVE TRANSFORMATION STUDY OF SITES NEAR PORT CANAVERAL INLET, FLORIDA

PART I: INTRODUCTION

1. The purpose of this study is to provide a 20-year time series of breaking wave conditions at 3-hour intervals for three sites north and two sites south of Port Canaveral Inlet, Fl. An orientation map is given in Figure 1. The study was funded by the US Army Engineer District, Jacksonville (SAJ).

2. The study was divided into three parts: (a) transformation of 20 years of hindcast wave data into conditions at a 60-ft depth; (b) refraction calculations to bring representative waves from deep water to shore, by application of the Regional Coastal Processes Numerical Model (RCPWAVE); (c) generation of a 20-year time series of breaking wave conditions for five different sites. The three parts of the study are described in the final section of the report. Appendices A and B contain supplementary tables giving wave statistics for deep water and breaking waves, respectively.

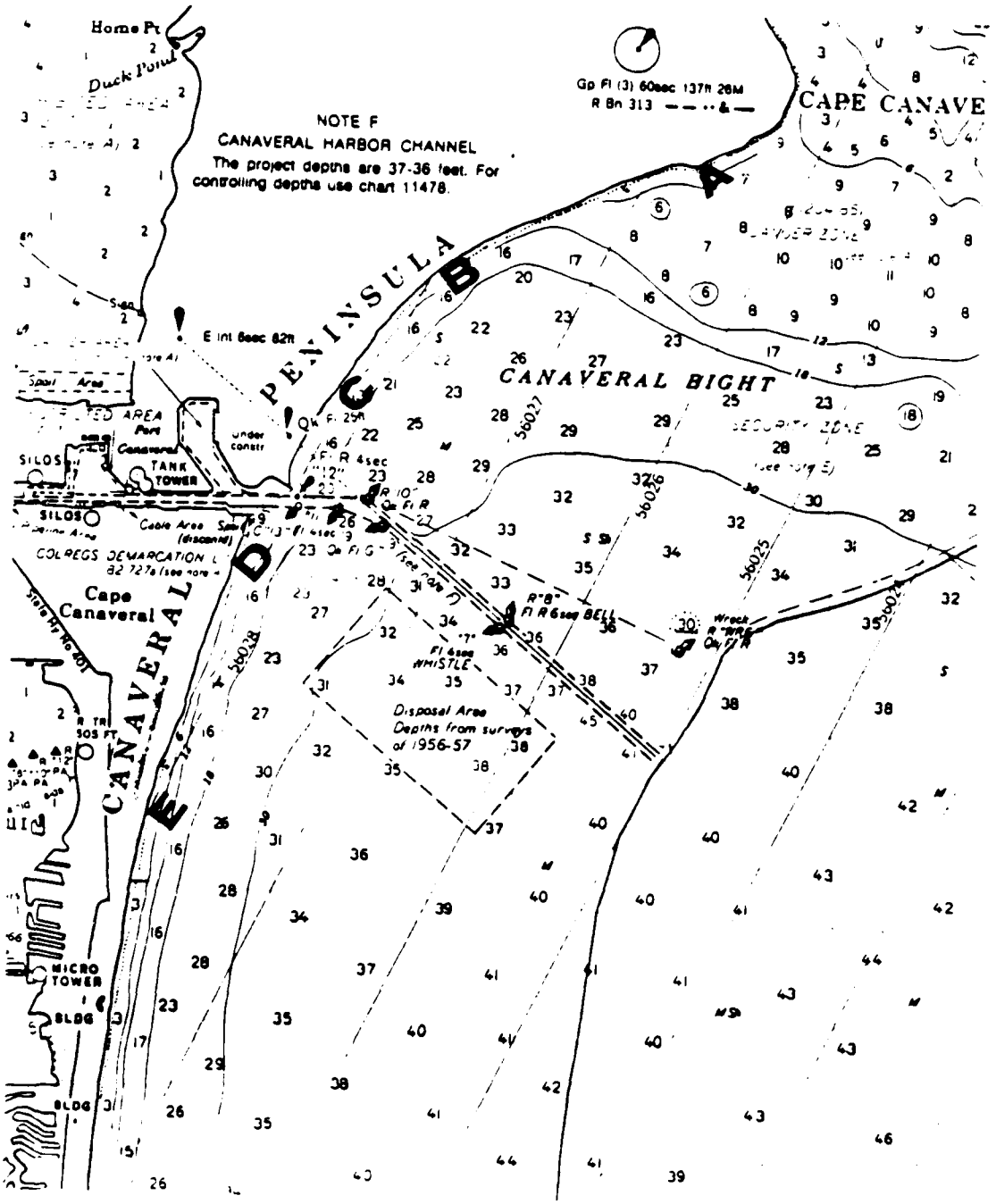

Figure 1. Orientation map for Port Canaveral

PART II: METHODOLOGY AND RESULTS

Offshore Wave Transformations

3. The Wave Information Study (WIS) makes available a 20-year hindcast for the Atlantic Ocean coast for the period 1956-1975. Phase II of the WIS hindcast includes a 20-year time series of wave height, wave direction, and wave period at 3-hour intervals for both sea and swell components at a location offshore of Port Canaveral. Hurricane wave data are not yet available from WIS and the effect of the Gulf Stream was not included in the wave hindcast or transformations. The WIS Phase II location (Station 64) used in this study is shown in Figure 2. For the purpose of the present study, information at this point was used as wave input to the WIS Phase III transformation technique (Jensen, 1983). The calculation involves the transformation of the offshore wave conditions to a water depth of 60 ft, assuming refraction and shoaling over straight and parallel bottom contours. This approach is reasonable for wave transformation over the bottom contours seaward of a 60-ft depth in the area. The transformation was halted at the 60-ft depth because the technique would not adequately treat wave transformation expected over the irregular nearshore bathymetry. Information at the 60-ft depth was used as input to a model for wave refraction over complex bathymetry as described later.

4. Twenty-year statistical summaries of the transformed Phase II wave data were produced. Appendix A contains summaries for each of the eight approach angle bands (one angle band = 22.5 deg), as well as a 20-year summary of all directions. The designation "Station 147" in Appendix A is used as a reference for the wave summaries at a 60-ft depth in the vicinity of WIS Phase III, Station 147. Data from Station 147 in the standard WIS reports and SEAS data base differ from the present study in that they are transformed to a 33-ft depth rather than 60 ft. These tables give the joint probability of wave height and wave period. Figure 3 illustrates the eight angle bands relative to the shoreline, and True North for the WIS hindcast wave statistics. The angles in parentheses are relative to the True North and the other angles are relative to shore normal, where shore normal is designated as 0 deg, anything north of shore normal is positive, and anything south of shore normal is

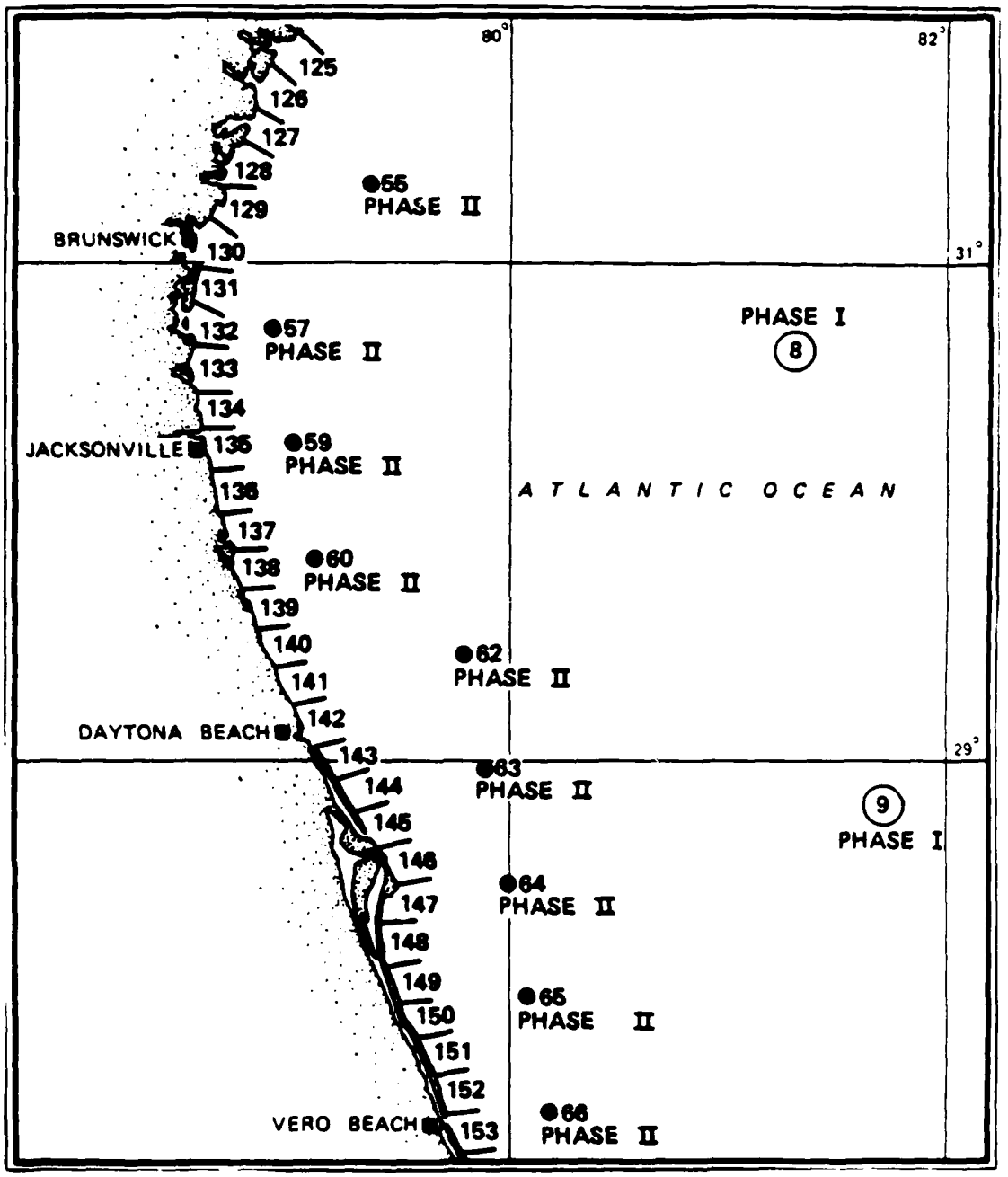

Figure 2. WIS Phase II point (Station 64)

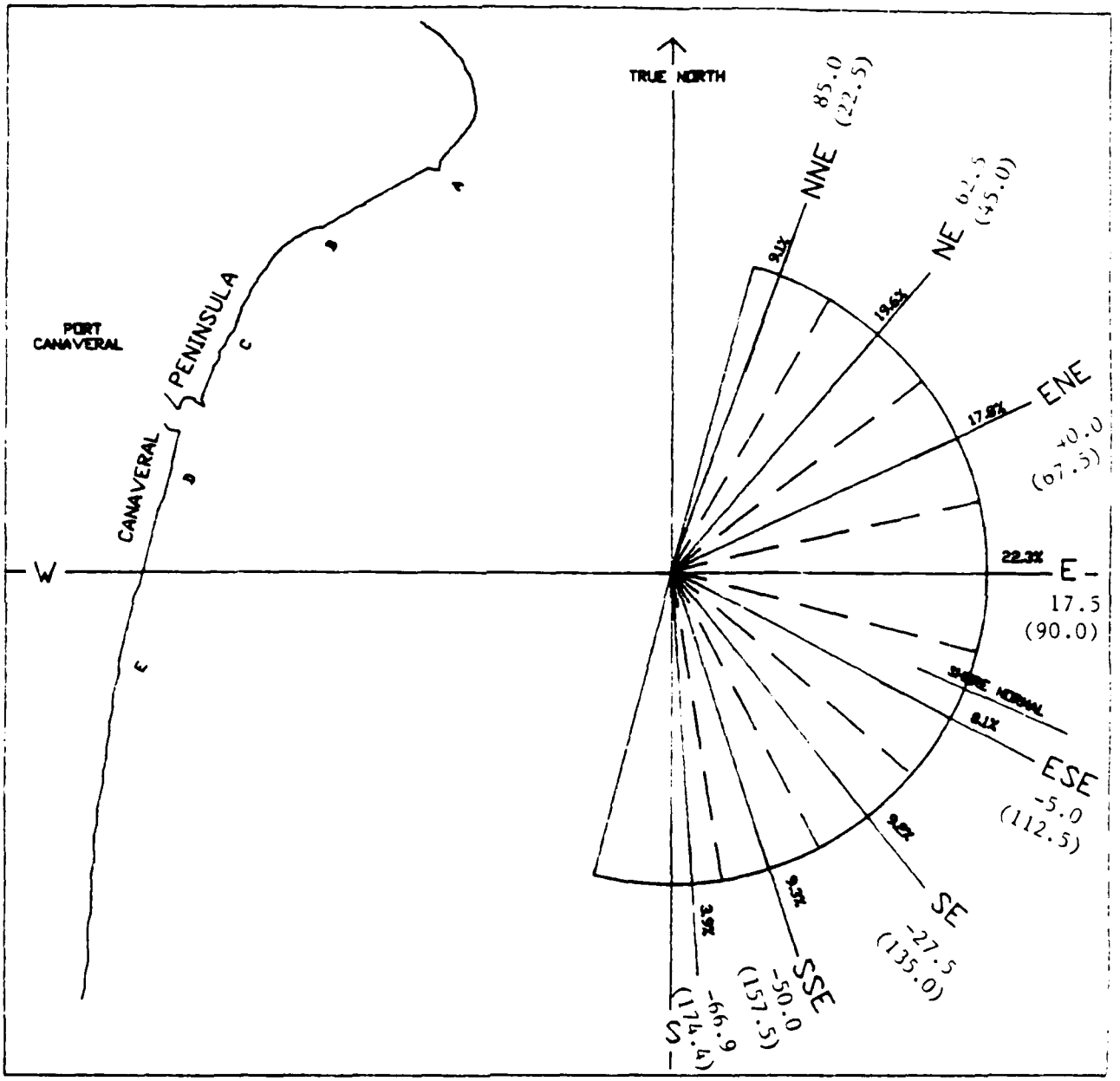

Figure 3. Eight wave angle bands defined by WIS relative to True North and shorenormal at Port Canaveral

negative. The numbers in each angle band are derived from the summary tables in Appendix A, where the first two angle bands are combined. The percentage values denote the percentage of wave cases approaching from the particular angle band. Table 1 gives a brief summary of selected wave statistics of the hindcast waves for each ocean sector of the compass, compiled from the data in Appendix A.

5. Table 1 and Figure 3 show the majority of the waves coming from the east (22.3%), east-northeast (17.8%), and northeast (19.6%), with fewer wave conditions coming from the outer directions. The wave height is less than 0.5 m 33% of the time and between 0.5 m and 0.99 m 33.8% of the time. The period is between 6.0 and 7.9 sec 27.9% of the time and between 4.0 and 5.9 sec 25.5% of the time.

6. Off the coast of Florida near Port Canaveral are two wave gages (US Army Corps of Engineers). The first (28°20'24"N, 80°25'12"W) is a directional (PUV) gage which was first installed in 1983. It is located offshore in about 17 m of water and has been functional 75% of the time. The second (28°24'42"N, 80°34'36"W) is a nondirectional (pressure) gage and was first installed in 1977. It is located nearshore in about 8 m of water and has been functional 48% of the time. Data from these gages show a general consistency between the measurements and WIS results.

Detailed Nearshore Wave Transformations

7. The refraction model RCPWAVE (Ebersole, Prater, and Cialone 1985) employs an interative, finite-difference scheme including full refraction and diffraction effects produced by an irregular sea bottom. basic assumptions are:

a. Gentle bottom slopes.
b. Linear, monochromatic and irrotational waves.
c. Negligible energy reflection.
d. Negligible energy loss due to bottom friction or wave breaking outside the surf zone.
e. Negligible wave and current interaction.

Table 1

Summary of Wave Statistics from WIS Hindcast

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	3.90	9.30	9.20	8.10	22.30	17.80	19.60	9.10
Average HS* (m)	0.23	0.69	0.63	0.76	1.01	1.05	0.99	1.00
Largest HS* (m)	0.82	2.58	3.25	3.49	4.38	5.58	4.13	2.71

* Denotes significant wave height.

8. Runs were made for 173 period and direction combinations. The runs chosen were determined by the WIS percent occurrence tables. The grid extended approximately 9 mi offshore and 11 mi alongshore with a cell size of 600 ft and 600 ft, respectively. Near breaking wave conditions were obtained from the output of RCPWAVE for the five different sites as shown in Figure 1.

Time Series of Breaking Wave Conditions

9. To create time series information the 20-year time series from Station 147 (60-ft depth) was processed by the following procedure. A dominant condition was chosen from the sea and swell WIS data at each time, and the dominant period determined. The WIS wave condition was then transformed to a near breaking condition using transformation coefficients as described in the previous section. A breaking wave condition was then generated by assuming straight parallel contours over the small remaining travel distance and using a breaking criterion of $H_b = 0.6\ d$. This step produced a more refined breaking wave estimate than could have been obtained from points on the RCPWAVE grid. Tables 2-6 give a brief summary of selected wave statistics of the breaking conditions for each ocean sector of the compass, compiled from the data in Appendix B.

Digital Output

10. The time series output of breaking wave conditions for the five different sites was written to tape and sent to SAJ under separate cover. A separate tape was prepared for each site. The output consisted of 20 years of data for the five sites. A sample output is shown in Table 7.

Table 2

Summary of Wave Statistics from Breaking Wave Conditions

Station A

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	0.00	0.00	2.60	58.00	7.70	2.30	26.60	0.80
Average HS* (m)	----	----	0.12	0.45	0.45	0.26	0.36	0.45
Largest HS* (m)	----	----	0.40	1.02	1.13	0.40	1.37	1.10

* Denotes significant wave height.

Table 3

Summary of Wave Statistics from Breaking Wave Conditions

Station B

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	0.00	0.10	2.40	1.90	13.70	33.90	40.30	7.60
Average HS* (m)	----	0.11	0.19	0.26	0.44	0.43	0.23	0.36
Largest HS* (m)	----	0.11	0.64	0.69	0.91	1.86	1.90	1.63

* Denotes significant wave height.

Table 4

Summary of Wave Statistics from Breaking Wave Conditions

Station C

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	0.00	0.00	2.60	13.50	50.60	29.00	4.40	0.00
Average HS* (m)	----	----	0.17	0.26	0.39	0.38	0.31	-----
Largest HS* (m)	----	----	0.46	0.73	1.30	1.94	1.60	-----

* Denotes significant wave height.

Table 5

Summary of Wave Statistics from Breaking Wave Conditions

Station D

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	0.00	0.00	2.60	27.40	47.20	9.30	13.50	0.00
Average HS* (m)	----	----	0.13	0.49	0.41	0.37	0.30	-----
Largest HS* (m)	----	----	0.67	1.90	2.23	1.94	1.65	-----

* Denotes significant wave height.

Table 6

Summary of Wave Statistics from Breaking Wave Conditions

Station E

	S	SSE	SE	ESE	E	ENE	NE	NNE
Percent Occurrence	0.00	0.10	4.30	46.60	26.20	11.40	11.40	0.00
Average HS* (m)	----	0.08	0.19	0.45	0.54	0.40	0.24	-----
Largest HS* (m)	----	0.08	0.70	2.19	3.08	1.92	1.01	-----

* Denotes significant wave height.

Table 7

Sample Output

Date	Depth (ft)	Period (sec)	Direction (deg)
56010100	.45	2.00	39.00
56010103	.45	4.00	39.00
56010106	.40	4.00	0.00
56010109	.70	4.00	9.00
56010112	.70	4.00	9.00
56010115	.70	4.00	9.00
56010118	.70	4.00	9.00
56010121	.40	4.00	0.00
56010200	.45	3.00	39.00
56010203	.45	3.00	39.00
56010206	.45	2.00	39.00
56010209	.45	2.00	39.00
56010212	.45	2.00	23.00
56010215	.30	2.00	-51.00
56010218	.30	1.00	-50.00
56010221	.30	1.00	-50.00

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Jensen, R. E. 1983. "Methodology for the Calculation of a Shallow Water Wave Climate," US Army Engineer Waterways Experiment Station. Coastal Engineering Research Center, Wave Information Study, Report 8.

Ebersole, B. A., Prater, M. A., and Cialone, M. A. 1985. "Regional Coastal Processes Numerical Modeling System: Report 1, RCPWAVE - A Linear Wave Propagation Model for Field Use," US Army Engineer Waterways Experiment Station," Coastal Engineering Research Center, CERC Technical Report.

Corps of Engineers. 1984. "Wave Data Report (Special Issue)," University of Florida Coastal Data Network, US Army Corps of Engineers, State of Florida, US Navy, US Nuclear Regulatory Commission.

APPENDIX A: WAVE SUMMARIES IN 60-FT DEPTH

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0. - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	39	395	1627	515	.	.	.	.	.	.		2576
0.50 - 0.99	.	1	160	6	.	.	.	.	.	.		167
1.00 - 1.49	.	.	1	.	.	.	.	.	.	.		1
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.		0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.		0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.		0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.		0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	39	396	1788	521	0	0	0	0	0	0		

AVERAGE HS(M) = 0.22 LARGEST HS(M) = 1.02 ANGLE CLASS % = 2.7

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	41	672	126	342	5	.	.	.	.	.		1186
0.50 - 0.99	.	169	1704	583	11	.	.	.	.	.		2467
1.00 - 1.49	.	3	612	800	39	.	.	.	.	.		1454
1.50 - 1.99	.	.	66	770	95	.	.	.	.	.		931
2.00 - 2.49	.	.	.	260	60	.	.	.	.	.		320
2.50 - 2.99	.	.	.	11	3	.	.	.	.	.		14
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.		0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	41	844	2508	2766	233	0	0	0	0	0		

AVERAGE HS(M) = 1.00 LARGEST HS(M) = 2.71 ANGLE CLASS % = 6.4

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	32	523	1	2891	1921	.	.	.	.	.		5367
0.50 - 0.99	.	562	1238	2809	2191	.	.	.	.	.		6800
1.00 - 1.49	.	3	1508	1054	1148	.	.	.	.	.		3713
1.50 - 1.99	.	.	343	831	529	5	1	.	.	.		1709
2.00 - 2.49	.	.	8	1067	335	1	.	.	.	.		1411
2.50 - 2.99	.	.	.	351	207	.	.	.	.	.		558
3.00 - 3.49	.	.	.	34	164	3	.	.	.	.		201
3.50 - 3.99	.	.	.	.	70	.	.	.	.	.		70
4.00 - 4.49	.	.	.	.	8	.	.	.	.	.		8
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	32	1088	2877	9047	6572	9	1	0	0	0		

AVERAGE HS(M) = 0.99 LARGEST HS(M) = 4.13 ANGLE CLASS % = 19.6

* Note these tables represent data which have been transformed to 60-ft water depth in the vicinity of WIS Phase III, Station 147.

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	27	980		1178	518	1131	1415	.	.	.		5249
0.50 - 0.99	.	879	1533	1093	1377	426	272	.	.	.		5580
1.000 - 1.49	.	3	1444	331	944	275	58	.	.	.		3055
1.500 - 1.99	.	.	415	467	379	164	27	.	.	.		1452
2.000 - 2.49	.	.	13	728	222	73	11	.	.	.		1047
2.500 - 2.99	.	.	.	646	169	65	20	.	.	.		900
3.000 - 3.49	.	.	.	77	231	22	5	1	.	.		336
3.500 - 3.99	.	.	.	1	83	.	5	.	.	.		89
4.000 - 4.49	.	.	.	.	39	.	.	5	.	.		44
4.500 - 4.99	.	.	.	.	3	.	.	5	.	.		8
5.00 - GREATER								10				10
TOTAL	27	1862	3405	4511	3965	2156	1813	21	0	0		

AVERAGE HS(M) = 1.05 LARGEST HS(M) = 5.58 ANGLE CLASS % = 17.8

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	35	1279		797	912	901	77	.	.	.		4001
0.50 - 0.99	.	1180	1827	473	1457	1546	1875	.	.	.		8358
1.000 - 1.49	.	.	1456	159	1031	1832	1475	.	.	.		5953
1.500 - 1.99	.	.	311	325	256	1466	302	.	.	.		2660
2.000 - 2.49	.	.	6	632	63	393	51	.	.	.		1145
2.500 - 2.99	.	.	.	231	32	77	6	.	.	.		346
3.000 - 3.49	.	.	.	20	46	8	.	.	.	.		74
3.500 - 3.99	.	.	.	.	5	1	.	.	.	.		6
4.000 - 4.49	.	.	.	.	5	.	.	.	.	.		6
4.500 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER												
TOTAL	35	2459	3600	2287	3875	6224	3786	0	0	0		

AVERAGE HS(M) = 1.01 LARGEST HS(M) = 4.38 ANGLE CLASS % = 22.3

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	65	1223		1108	494	15	.	.	.	.		2905
0.50 - 0.99	.	1026	1490	278	491	6	.	.	.	.		3291
1.000 - 1.49	.	.	1090	34	59	.	.	.	.	.		1183
1.500 - 1.99	.	.	239	193	18	.	.	.	.	.		450
2.000 - 2.49	.	.	3	167	.	.	.	.	.	.		170
2.500 - 2.99	.	.	.	92	5	.	.	.	.	.		97
3.000 - 3.49	.	.	.	8	8	.	.	.	.	.		16
3.500 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.000 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.500 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER												
TOTAL	65	2249	2822	1895	1075	21	0	0	0	0		

AVERAGE HS(M) = 0.76 LARGEST HS(M) = 3.49 ANGLE CLASS % = 8.1

* Note these data represent data from WIS Station 147 which have been transformed to 60-ft water depths

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	61	1129		3588	5	.	.	.	.	.		4783
0.50 - 0.99	.	797	1249	662	13	.	.	.	.	.		2721
1.00 - 1.49	.	.	1013	71	1	.	.	.	.	.		1085
1.50 - 1.99	.	.	112	207	.	.	.	.	.	.		319
2.00 - 2.49	.	.	.	212	.	.	.	.	.	.		212
2.50 - 2.99	.	.	.	46	.	.	.	.	.	.		46
3.00 - 3.49	.	.	.	6	3	.	.	.	.	.		9
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	61	1926	2374	4792	24	0	0	0	0	0		

AVERAGE HS(M) = 0.63 LARGEST HS(M) = 3.25 ANGLE CLASS % = 9.2

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	107	2513	367	285	10	.	.	.	.	.		3282
0.50 - 0.99	.	520	2934	711	47	.	.	.	.	.		4212
1.00 - 1.49	.	.	691	629	15	.	.	.	.	.		1335
1.50 - 1.99	.	.	22	323	10	.	.	.	.	.		355
2.00 - 2.49	.	.	.	85	1	.	.	.	.	.		86
2.50 - 2.99	.	.	.	1	.	.	.	.	.	.		1
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.		0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	107	3033	4014	2034	83	0	0	0	0	0		

AVERAGE HS(M) = 0.69 LARGEST HS(M) = 2.58 ANGLE CLASS % = 9.3

STATION 147 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)											TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER		
0. - 0.49	75	1617	1928	65	.	.	.	.	.	.		3685
0.50 - 0.99	.	.	188	10	.	.	.	.	.	.		198
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.		0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.		0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.		0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.		0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.		0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.		0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.		0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.		0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.		0
TOTAL	75	1617	2116	75	0	0	0	0	0	0		

AVERAGE HS(M) = 0.23 LARGEST HS(M) = 0.82 ANGLE CLASS % = 3.9

* Note these data represent data from WIS Station 147 which have been transformed to 60-ft water depths.

STATION 147 20 YEARS FOR ALL DIRECTIONS
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
WATER DEPTH = 18.29 METERS
PERCENT OCCUPRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0. - 0.49	48	1033	405	1077	386	204	149	.	.	.	3302
0.50 - 0.99	.	513	1233	662	563	157	214	.	.	.	3342
1.00 - 1.49	.	1	759	308	284	210	153	.	.	.	1715
1.50 - 1.99	.	.	151	312	124	163	33	.	.	.	783
2.00 - 2.49	.	.	3	230	73	46	9	.	.	.	361
2.50 - 2.99	.	.	.	199	41	14	2	.	.	.	256
3.00 - 3.49	.	.	.	14	45	3	.	.	.	.	62
3.50 - 3.99	.	.	.	.	15	.	.	.	.	.	15
4.00 - 4.49	.	.	.	.	5	.	.	.	.	.	5
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	.
TOTAL	48	1547	2550	2792	1581	837	557	1	0	0	9913

AVE HS(M) = 0.87 LARGEST HS(M) = 5.58 TOTAL CASES = 59440

* Note these data represent data from WIS Station 147 which have been transformed to 60-ft water depths.

APPENDIX B: BREAKING WAVE SUMMARIES

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0.00 - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	48	.	.	.	.	.	49
0.50 - 0.99	.	.	.	32	1	.	.	.	.	.	33
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	32	49	0	0	0	0	0	

AVERAGE HS(M) = 0.45 LARGEST HS(M) = 1.10 ANGLE CLASS % = 0.8

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	32	673	818	563	57	1	.	.	.	.	2146
0.50 - 0.99	.	.	286	100	10	.	.	.	.	.	396
1.00 - 1.49	.	.	40	75	1	.	.	.	.	.	117
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	32	673	1145	738	68	1	0	0	0	0	

AVERAGE HS(M) = 0.36 LARGEST HS(M) = 1.37 ANGLE CLASS % = 26.6

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	225	.	.	.	.	.	.	.	.	231
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	225	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.26 LARGEST HS(M) = 0.40 ANGLE CLASS % = 2.3

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	246	.	.	.	87	189	.	.	.	528
0.50 - 0.99	.	.	.	.	.	43	183	.	.	.	227
1.00 - 1.49	.	.	.	.	.	7	5	.	.	.	13
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	246	0	0	0	138	378	0	0	0	

AVERAGE HS(M) = 0.45 LARGEST HS(M) = 1.13 ANGLE CLASS % = 7.7

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	3	186	813	1063	747	308	168	.	.	.	3291
0.50 - 0.99	.	.	617	852	631	245	13	2	.	.	2361
1.00 - 1.49	.	.	.	.	.	147	.	.	.	.	147
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	3	186	1430	1915	1379	701	181	2	0	0	

AVERAGE HS(M) = 0.45 LARGEST HS(M) = 1.02 ANGLE CLASS % = 58.0

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	17	240	.	.	.	.	.	.	.	.	257
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	17	240	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.12 LARGEST HS(M) = 0.40 ANGLE CLASS % = 2.6

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION A 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION A
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	65	1571	1632	1626	853	397	357	.	.	.	6504
0.50 - 0.99	.	.	903	984	642	289	196	2	.	.	3019
1.00 - 1.49	.	.	40	75	1	155	5	.	.	.	278
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	65	1571	2575	2687	1497	841	560	2	0	0	

AVE HS(M) = 0.41 LARGEST HS(M) = 1.37 TOTAL CASES = 58440

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0.00 - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	550	106	.	.	.	.	.	.	656
0.50 - 0.99	.	.	.	63	.	.	.	.	.	.	63
1.00 - 1.49	.	.	.	41	.	.	.	.	.	.	41
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	550	211	0	0	0	0	0	0	

AVERAGE HS(M) = 0.36 LARGEST HS(M) = 1.63 ANGLE CLASS % = 7.6

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	32	481	122	793	888	831	554	.	.	.	3703
0.50 - 0.99	.	.	177	66	13	10	6	2	.	.	277
1.00 - 1.49	.	.	12	31	1	.	.	.	.	.	45
1.50 - 1.99	.	.	.	5	.	.	.	.	.	.	6
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	32	481	312	897	903	841	560	2	0	0	

AVERAGE HS(M) = 0.23 LARGEST HS(M) = 1.90 ANGLE CLASS % = 40.3

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	192	615	1282	408	.	.	.	.	.	2504
0.50 - 0.99	.	.	176	212	122	.	.	.	.	.	510
1.00 - 1.49	.	.	34	117	150	.	.	.	.	.	302
1.50 - 1.99	.	.	.	74	.	.	.	.	.	.	74
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	192	825	1686	681	0	0	0	0	0	

AVERAGE HS(M) = 0.43 LARGEST HS(M) = 1.86 ANGLE CLASS % = 33.9

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	471	455	.	.	.	.	.	.	.	933
0.50 - 0.99	.	.	432	.	.	.	.	.	.	.	432
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	471	887	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.44 LARGEST HS(M) = 0.91 ANGLE CLASS % = 13.7

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	3	186	.	.	.	.	.	.	.	.	189
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	3	186	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.26 LARGEST HS(M) = 0.69 ANGLE CLASS % = 1.9

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	2	239	.	.	.	.	.	.	.	.	242
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	2	240	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.19 LARGEST HS(M) = 0.64 ANGLE CLASS % = 2.4

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	14	.	.	.	.	.	.	.	.	.	14
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	14	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.11 LARGEST HS(M) = 0.11 ANGLE CLASS % = 0.1

STATION B 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION B
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	65	1570	1743	2181	1296	831	554	.	.	.	8243
0.50 - 0.99	.	1	785	342	136	10	6	2	.	.	1284
1.00 - 1.49	.	.	46	191	152	.	.	.	.	.	389
1.50 - 1.99	.	.	.	80	.	.	.	.	.	.	81
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	65	1571	2575	2796	1585	841	560	2	0	0	

AVE HS(M) = 0.34 LARGEST HS(M) = 1.90 TOTAL CASES = 58440

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0.00 - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	32	481	550	106	.	.	.	.	.	.	1169
0.50 - 0.99	.	.	75	63	.	.	.	.	.	.	139
1.00 - 1.49	.	.	.	41	.	.	.	.	.	.	41
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	32	481	625	211	0	0	0	0	0	0	

AVERAGE HS(M) = 0.31 LARGEST HS(M) = 1.60 ANGLE CLASS % = 13.5

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	192	268	1114	1216	448	366	.	.	.	3613
0.50 - 0.99	.	.	213	160	269	382	187	.	.	.	1213
1.00 - 1.49	.	.	37	57	96	8	6	.	.	.	208
1.50 - 1.99	.	.	.	16	2	.	.	1	.	.	20
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	192	519	1348	1585	840	560	2	0	0	

AVERAGE HS(M) = 0.78 LARGEST HS(M) = 1.94 ANGLE CLASS % = 50.6

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(MET	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	225	1193	711	.	1	.	.	.	.	2137
0.50 - 0.99	.	.	192	349	.	.	.	.	.	.	541
1.00 - 1.49	.	.	45	174	.	.	.	.	.	.	219
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	225	1430	1235	0	1	0	0	0	0	

AVERAGE HS(M) = 0.39 LARGEST HS(M) = 1.30 ANGLE CLASS % = 29.0

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	3	432	.	.	.	.	.	.	.	.	435
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	3	432	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.26 LARGEST HS(M) = 0.73 ANGLE CLASS % = 4.4

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	17	240	.	.	.	.	.	.	.	.	257
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	17	240	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.17 LARGEST HS(M) = 0.46 ANGLE CLASS % = 2.6

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION C 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION C
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	65	1571	2011	1931	1216	450	366	.	.	.	7613
0.50 - 0.99	.	.	481	573	269	382	187	.	.	.	1895
1.00 - 1.49	.	.	82	274	96	8	6	.	.	.	469
1.50 - 1.99	.	.	.	16	2	.	.	1	.	.	20
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	65	1571	2575	2796	1585	841	560	2	0	0	

AVE HS(M) = 0.36 LARGEST HS(M) = 1.94 TOTAL CASES = 58440

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0.00 - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	18.0- LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 7.9	8.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- 17.9	18.0- LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	32	481	550	106	.	.	.	.	.	.	1169
0.50 - 0.99	.	.	72	96	.	.	.	.	.	.	169
1.00 - 1.49	.	.	2	9	.	.	.	.	.	.	11
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	32	481	625	211	0	0	0	0	0	0	

AVERAGE HS(M) = 0.30 LARGEST HS(M) = 1.65 ANGLE CLASS % = 13.5

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	192	122	424	7	.	.	.	.	.	753
0.50 - 0.99	.	.	114	28	1	.	.	.	.	.	144
1.00 - 1.49	.	.	.	21	1	.	.	.	.	.	22
1.50 - 1.99	.	.	.	5	.	.	.	.	.	.	6
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	192	237	479	10	0	0	0	0	0	

AVERAGE HS(M) = 0.37 LARGEST HS(M) = 1.94 ANGLE CLASS % = 9.3

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	225	320	642	1292	425	363	.	.	.	3275
0.50 - 0.99	.	.	296	126	255	362	187	.	.	.	1228
1.00 - 1.49	.	.	25	90	18	52	8	.	.	.	195
1.50 - 1.99	.	.	.	10	6	1	.	.	.	.	19
2.00 - 2.49	.	.	.	.	.	.	.	1	.	.	2
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	225	642	869	1573	841	560	2	0	0	

AVERAGE HS(M) = 0.41 LARGEST HS(M) = 2.23 ANGLE CLASS % = 47.2

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	3	432	638	711	.	.	.	.	.	.	1785
0.50 - 0.99	.	.	429	345	.	.	.	.	.	.	775
1.00 - 1.49	.	.	2	135	.	.	.	.	.	.	137
1.50 - 1.99	.	.	.	43	.	.	.	.	.	.	43
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	3	432	1070	1235	0	0	0	0	0	0	

AVERAGE HS(M) = 0.49 LARGEST HS(M) = 1.90 ANGLE CLASS % = 27.4

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	17	239	.	.	.	.	.	.	.	.	256
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	17	240	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.13 LARGEST HS(M) = 0.67 ANGLE CLASS % = 2.6

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION D 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION D
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	65	1570	1632	1883	1300	425	363	.	.	.	7241
0.50 - 0.99	.	1	913	596	257	362	187	.	.	.	2318
1.00 - 1.49	.	.	30	256	19	52	8	.	.	.	367
1.50 - 1.99	.	.	.	59	6	1	.	.	.	.	68
2.00 - 2.49	.	.	.	.	.	.	.	1	.	.	2
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	65	1571	2575	2796	1584	841	560	2	0	0	

AVE HS(M) = 0.40 LARGEST HS(M) = 2.23 TOTAL CASES = 58440

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 0.00 - 11.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 11.25 - 33.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 33.75 - 56.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	32	481	550	.	.	.	.	.	.	.	1063
0.50 - 0.99	.	.	72	.	.	.	.	.	.	.	72
1.00 - 1.49	.	.	2	.	.	.	.	.	.	.	2
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	32	481	625	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.24 LARGEST HS(M) = 1.01 ANGLE CLASS % = 11.4

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 56.25 - 78.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	192	122	530	7	.	.	.	.	.	859
0.50 - 0.99	.	.	114	92	1	.	.	.	.	.	208
1.00 - 1.49	.	.	.	62	1	.	.	.	.	.	64
1.50 - 1.99	.	.	.	6	.	.	.	.	.	.	6
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	192	237	691	10	0	0	0	0	0	

AVERAGE HS(M) = 0.40 LARGEST HS(M) = 1.92 ANGLE CLASS % = 11.4

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 78.75 - 101.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	6	225	145	265	336	242	357	.	.	.	1578
0.50 - 0.99	.	.	136	70	112	331	189	.	.	.	840
1.00 - 1.49	.	.	.	45	36	42	9	.	.	.	133
1.50 - 1.99	.	.	.	36	8	8	3	.	.	.	57
2.00 - 2.49	.	.	.	.	1	.	.	.	.	.	2
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	1	.	.	1
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	6	225	282	417	495	624	560	2	0	0	

AVERAGE HS(M) = 0.54 LARGEST HS(M) = 3.08 ANGLE CLASS % = 26.2

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 101.25 - 123.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	3	246	813	970	819	155	.	.	.	.	3007
0.50 - 0.99	.	.	613	528	183	45	.	.	.	.	1371
1.00 - 1.49	.	.	3	188	62	7	.	.	.	.	260
1.50 - 1.99	.	.	.	.	13	8	.	.	.	.	21
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	3	246	1430	1686	1078	216	0	0	0	0	

AVERAGE HS(M) = 0.45 LARGEST HS(M) = 2.19 ANGLE CLASS % = 46.6

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 123.75 - 146.24
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	2	425	.	.	.	.	.	.	.	.	428
0.50 - 0.99	.	1	.	.	.	.	.	.	.	.	1
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	2	426	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.19 LARGEST HS(M) = 0.70 ANGLE CLASS % = 4.3

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 146.25 - 168.74
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	14	.	.	.	.	.	.	.	.	.	14
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	14	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.08 LARGEST HS(M) = 0.08 ANGLE CLASS % = 0.1

STATION E 20 YEARS WAVE APPROACH ANGLE(DEGREES)= 168.75 - 180.00
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X1000) OF HEIGHT AND PERIOD BY DIRECTION

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	.	.	.	.	.	.	.	.	.	.	0
0.50 - 0.99	.	.	.	.	.	.	.	.	.	.	0
1.00 - 1.49	.	.	.	.	.	.	.	.	.	.	0
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	0	0	0	0	0	0	0	0	0	0	

AVERAGE HS(M) = 0.00 LARGEST HS(M) = 0.00 ANGLE CLASS % = 0.0

STATION E
WAVE APPROACH ANGLES RELATIVE TO TRUE NORTH
PERCENT OCCURRENCE(X100) OF HEIGHT AND PERIOD FOR ALL DIRECTIONS

HEIGHT(METERS)	PERIOD(SECONDS)										TOTAL
	0.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10.0-11.9	12.0-13.9	14.0-15.9	16.0-17.9	18.0-LONGER	
0.00 - 0.49	65	1570	1632	1766	1163	397	357	.	.	.	6953
0.50 - 0.99	.	1	937	691	297	376	189	.	.	.	2494
1.00 - 1.49	.	.	5	296	100	49	9	.	.	.	461
1.50 - 1.99	.	.	.	42	22	17	3	.	.	.	85
2.00 - 2.49	.	.	.	.	1	.	.	.	.	.	2
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	1	.	.	1
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	0
5.00 - GREATER	.	.	.	.	.	.	.	.	.	.	0
TOTAL	65	1571	2575	2796	1584	841	560	2	0	0	

AVE HS(M) = 0.43 LARGEST HS(M) = 3.08 TOTAL CASES = 58440

END

FEB.

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